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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,038	12/01/2003	Anis Zribi	134575-1	4724

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GENERAL ELECTRIC COMPANY (PCPI)
C/O FLETCHER YODER
P. O. BOX 692289
HOUSTON, TX 77269-2289

EXAMINER	
CHRISTENSEN, RYAN S	
ART UNIT	**PAPER NUMBER**
2856	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/726,038	ZRIBI, ANIS	
	Examiner	Art Unit	
	Ryan Christensen	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12-01-2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,17-33,37 and 38* is/are rejected.

7)☒ Claim(s) *14-16 and 34-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12-1-2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 5, 6, 8 11-13, 17-20, 23, 24, 26, 28, 30-33, 37, 38 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,397,661 (Grimes et al).

3. With respect to claims 1 and 19 Grimes et al. disclose sensor device operable for sensing water vapor (moisture, Col. 1, lines 14-37) or a predetermined chemical vapor, the sensor device comprising: a thin film, wherein the thin film comprises: a sensing layer (sensor structure, 10), wherein the sensing layer comprises one of a nanostructured layer and a self-assembled monomolecular layer (zeolite, 12a and Col. 9, line 8); a soft magnetic layer (16, Fig. 1 and Col 8, lines 45-60) disposed directly or indirectly adjacent to the sensing layer (Fig. 1); wherein the thin film has a first mass, a first density, and a first magnetostrictive resonance frequency prior to the sensing layer adsorbing a predetermined amount of a predetermined vapor; and wherein the thin film has a second mass, a second density, and a second magnetostrictive resonance frequency subsequent to the sensing layer adsorbing the predetermined amount of the predetermined vapor (Col. 9 line 63 to Col. 10, line 12 and Col. 21 lines 14-41); a driving coil (46, Fig.

3) disposed indirectly adjacent to and at a predetermined distance from the thin film (Fig. 3), the driving coil operable for generating an alternating-current magnetic field used to query a shift in the magnetostrictive resonance frequency of the thin film from the first magnetostrictive resonance frequency to the second magnetostrictive resonance frequency (Col. 21, lines 14-41); and a measuring coil disposed (62A, Fig. 4) indirectly adjacent to and at a predetermined distance from the thin film (Fig. 4), the measuring coil operable for measuring and quantifying the shift in the magnetostrictive resonance frequency of the thin film from the first magnetostrictive resonance frequency to the second magnetostrictive resonance frequency (Col. 9 line 63 to Col. 10, line 12 and Col. 21 lines 14-41).

4. With respect to claims 2, 6, 8, 20, 24, 26 Grimes et al disclose a sensor being .03 mm thick (Col. 21, line 38).

5. With respect to claims 5 and 23, Grimes et al. disclose the sensing layer comprising a zeolite (Col. 9, line 8).

6. With respect to claims 11 and 31, Grimes et al. disclose a processing unit (64) for processing and manipulating the data before outputting it (Col. 20 line 65 to Col. 21, line 13) which is considered to be an contain data relating to the pre-correlated series of resonant frequency values taken at different masses (Col. 9. line 63 to Col. 10, line 12 and Col. 22 lines 20-67).

7. With respect to claims 12 and 32, Grimes et al. disclose the sensor for detecting moisture or water vapor (Col 1, lines 29-30).

8. With respect to claims 13 and 33, Grimes et al. discloses an adhesive layer between the soft magnetic layer (16) and the sensing layer (14) (See Col. 12, lines 54-57 and Fig. 1B). Polymers and metals such as chromium are well known in the art as adhesive layers.

9. With respect to claims 17 and 37 Grimes et al. disclose their invention as being having structural design flexibility, indicating the invention can be placed on a micro circuit (Col. 6, lines 52-57), and this implies the component will be placed on a substrate. Grimes et al. also disclose sputtering the part of the thin film (Col. 12, lines 48-54).

10. With respect to claims 18 and 38, Grimes et al. disclose an antenna (satellite link, Col. 21, lines 13) for transmitting data.

11. With respect to claim 28, Grime et al. disclose depositing the sensing layer on the soft magnetic layer in a number of ways, sputtering, chemical deposition, application of gels or liquids that are dried or evaporated (Col. 12, lines 48-54).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 7, 10, 25 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,397,661 (Grimes et al).

15. With respect to claims 7 and 25, Grimes et al. disclose that the soft magnetic layer can be made from an alloy of iron.

16. In the alternative Grimes et al. disclose the soft magnetic layer can be made of an alloy of an element selected from iron, terbium or dysprosium among others. While Grimes et al. do not explicitly disclose an alloy containing all three, the courts have held that it is not inventive to combine equivalents for the same purpose. Because iron, terbium and dysprosium are all disclosed as suitable for a soft magnetic material it would have been obvious to one of ordinary skill in the art at the time of the invention to use an alloy with each of these elements (See MPEP 2144.06).

17. With respect to claims 10 and 26 Grimes et al. do not explicitly disclose the distance between the drive and receiving coil being between 1 cm and .5 m. From the figures it appears both coils are with in this range. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to

place the coils at this distance as a matter of optimization, if not as a matter of common knowledge, and the courts have held optimization as a matter of routine experimentation not to be inventive (See MPEP 2144.05).

18. Claims 3, 4, 9, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,397,661 (Grimes et al) in view of U.S. Patent 6,359,444 (Grimes et al.).

19. With respect to claims 3, 4, 21 and 22, Grimes et al. (US 6,397,661) disclose a layer which is selective/sensitive to the fluid of interest, but do not explicitly disclose that carbon nanotubes for this layer. However, Grimes et al. (US 6,359,444) disclose the use of carbon nanotubes as a selective/sensitive layer in a similar system, which measures the change in resonance. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Grimes et al. (US 6,397,661) by including a selective/sensitive layer of carbon nanotubes, as disclosed by Grimes et al. (US 6,359,444), because carbon nanotubes were known in the art for selective/sensitive layers on gas sensors (See MPEP 2144.06).

20. With respect to claims 9 and 29, Grimes et al. (US 6,397,661) do not explicitly disclose details about the coils including planar coils on wafers. However, Grimes et al. (US 6,359,444) disclose a similar system for measuring where the coils are disclosed as planar coils, which would be disposed on some substrate that would be considered a wafer. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by

Grimes et al. (US 6,397,661) by using planar coils, because planar coils are well known in the art for this purpose, and to dispose these on a substrate or wafer for support.

21. Claims 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,397,661 (Grimes et al.) in view of U.S. Patent 6,359,444 (Grimes et al.) in further view of U.S. Patent Publication Application 2004/0105807 (Fan et al.).

22. With respect to claim 27, the combination as applied to claims 21 and 22 disclose the use of nanotubes for the sensing layer in chemical sensors, but does not explicitly disclose growing the nanotubes on the soft magnetic layer. However, Fan et al. disclose how to grow nanotubes for use in applications such as chemical sensors. Fan et al. further disclose growing nanotubes on an iron layer (paragraphs 0022-0027). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by the combination as applied to claims 21 and 22 by growing the nanotubes on the iron, as disclosed by Fan et al., to reduce the steps in the production of such a chemical sensor with a nanotube sensing layer.

Allowable Subject Matter

23. Claims 14-16 and 34-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Pertinent Prior Art

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

25. U.S. Patent 6,393,921 (Grimes et al.) discloses a similar system that measures the partial pressure of a gas which is related to is mass or concentration through the magneto-elastic resonant frequency of a sensor that absorbs the gs of interest.

26. U.S. Patent Application 2002/0166382 (Bachas et al.) discloses a sensor for measuring the elastic properties of a thin film layer by measuring a magneto-elastic resonant frequency.

27. U.S. Patent 5,821,129 (Grimes et al.) discloses a chemical sensor utilizing magnetostricive properties.

Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Christensen whose telephone number is 571-272-2683. The examiner can normally be reached on Monday - Friday, 8am - 5pm.

29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RC

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800